PACE®

MBT 201 SYSTEMS

OPERATION &

MAINTENANCE

MANUAL

MANUAL NO. 5050-0381

REV. E

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PACE products meet or exceed all applicable military and civilian EOS/ESD, temperature stability and other specifications, including MIL-STD-2000 ANSI/J-STD-001, IPC 7711, IPC 7721 and IPC-A-610.

For any questions regarding this Operation & Maintenance Manual, contact your local authorized PACE distributor or contact PACE directly at the appropriate address listed below.

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General Information

Introduction

The MBT 201 Universal Soldering/Desoldering Systems provide the user with the power and versatility to remove and install SMD and Thru-Hole devices. The power source incorporates a highly responsive SensaTemp (closed-loop) temperature control system which provides power to the two output channels on the MBT 201 systems. Accessory handpieces (standard & optional) and special use tips allow the user to remove and replace a wide variety of surface mount components.

The self-contained **AUTO SNAP-VAC** pump provides an automatic minimum on-time of 1.2 seconds to virtually eliminate re-sweat joints, tip clogging and maintenance while dramatically increasing tip life.

Virtually all of today's specialized handpieces with large SMD tips suffer from a problem in which the actual tip temperature that the work sees can be more than 100°F cooler than the Set Tip Temperature on the Variable Temperature Control. MBT 201 systems feature PACE's unique Tip & Temperature Selection System which allows the user to set the true temperature desired for any size and type of tip or handpiece.

The MBT 201 systems are available in a 115 VAC (97-127 VAC) version or a 230 VAC (196-253 VAC) version. The 230 VAC version system bears the CE Conformity Marking which assures the user that it conforms to all the requirements of council directive EMC 89/336/EEC. The systems package includes the power source with a selection of accessories and functional aids. These systems are as follows.

MBT 201-SD SYSTEM - Consists of MBT 201 (115 VAC, 60 Hz Version) Power Source, PS-90 Soldering Iron, SX-80 Sodr-X-Tractor, SX & PS Tip & Tool Stands, Tip & Temperature Selection System Charts and Accessory Kit.

MBT 201E-SD SYSTEM - Consists of MBT 201E (230 VAC, 50 Hz Version) Power Source, PS-90 Soldering Iron, SX-80 Sodr-X-Tractor, SX & PS Tip & Tool Stands, Tip & Temperature Selection System Charts and Accessory Kit.

The MBT 201 systems meet all applicable EOS/ESD, temperature stability and other government and industry specification requirements (including MIL-STD-2000A). They contain PACE's unique SensaTemp temperature management system for high performance and safety, plus a Tip Offset Compensation feature for superior thermal process control.

Specifications

POWER REQUIREMENTS

MBT 201 System - Version operates on 97-127 VAC, 50/60 Hz.
138 Watts, 1.2 Amp typical; 184 Watts, 1.6 Amp maximum

MBT 201E System - Version operates on 196-264 VAC, 50 Hz.
138 Watts, 0.6 Amp typical; 199 Watts, 0.9 Amp maximum

VACUUM AND AIR

Measurements at front panel **AUTO SNAP-VAC** and Controllable **PRESSURE** Ports of power source.

Vacuum Rise Time:	Evacuates 33 cc (2 cubic inch) volume to 25 cm Hg. (10 in. Hg.) in 200 ms.
Vacuum:	51 cm Hg. (20 in. Hg.) (nominal).
Pressure:	.48 Bar (7 P.S.I.) (nominal, "**MAX**" setting).
Air Flow:	9 SLPM (0.32 SCFM) maximum.

ENVIRONMENTAL REQUIREMENTS

Ambient Operating Temperature:	0°C to 50°C (32°F to 120°F).
Storage Temperature:	-40°C to 100°C (-40°F to 212°F).

PHYSICAL PARAMETERS

Size:	13.5 cm H X 16.5 cm W X 20.3 cm D (5.3 in. H X 6.5 in. W X 8.0 in. D)
Weight:	MBT 201 3.7 kg. (8.1 lbs.) MBT 201E 3.7 kg. (8.1 lbs.)

TEMPERATURE SPECIFICATIONS

Tip Temperature Range: 232°C to 482°C (450°F to 900°F), nominal.

Accuracy: ±5% of control setting

Tip Temperature Stability: ±1.1°C (2°F) at idle from Set Tip Temperature.

NOTE
True minimum and maximum Operating Tip Temperatures may vary depending on handpiece & tip selection.

EOS / ESD

Tip-To-Ground Resistance: Less than 2 ohms.

AC Leakage: Less then 2 millivolts RMS from 50Hz to 500Hz, min.

General Information

Standard Handpieces

All capabilities are dependent upon the use of the appropriate Functional Accessories or Work Aids. Available handpieces and their associated assembly and repair functions are listed below (a manual is provided separately with each handpiece which describes the applications and recommended procedures for that particular tool).

PS-90 Soldering Iron - Standard handpiece on MBT 201 & MBT 201E systems. Provides a wide range of SMD and thru-hole installation and removal capability as well as unsurpassed thermal performance on heavy, multilayer thru-hole assemblies at safe, lower working temperatures. A wide variety of 3/16" shank, quick change thru-hole and SMD tips (for chip components, SOTs, SOICs and other components) are available.

SX-80 Sodr-X-Tractor Handpiece - Standard handpiece on MBT 201 & MBT 201E systems. Provides thermally enhanced thru-hole desoldering on heavy multilayer assemblies, especially during continuous use. With the unique Flo-D-Sodr tip, the Sodr-X-Tractor performs safe, continuous SMT land cleaning and preparation. The slim-line, pencil-grip design and finger-actuated vacuum switch allow easy use and manipulation in tight places.

Optional Handpieces

TT-65 ThermoTweez Handpiece - Provides safe, one-handed reflow and removal of PLCCs, LCCCs, chip components and other surface mount devices. Its high thermal capacity and targeted heat quickly removes large SMDs without damage to the board or adjacent components, even on heavy, multilayer assemblies. The unique, vertically oriented design and a wide variety of quick change tips easily reach into tight work areas for safe SMD removal.

PS-70 Soldering Iron - Designed for high volume, single point soldering operations. It's thin heater and balanced feel make the PS-70 the perfect choice for applications where visibility and iron control is required, such as micro-soldering applications. The PS-70 is one of the most responsive irons on the market due to its quick-heat generator that provides fast and stable heat flow as needed. The PS-70 uses 1/8" shank, quick change PERMAGROUND tips.

Optional Handpieces

TJ-70 ThermoJet Handpiece - Provides safe, rapid installation of SMDs including chip components, SOTs, SOICs, PLCCs, LCCCs and FlatPacks. The slim-line design and precision focused air flow lets you easily target controlled heat right at the solder joints without damaging the board or adjacent components. A finger-actuated air switch and SensaTemp control provide safe, "on-demand" capability without constant running of the air pump.

TP-65 ThermoPik Handpiece - Provides safe, one-handed reflow and removal of a wide variety of PQFPs and FlatPacks in just seconds. The high thermal efficiency design targets controlled SensaTemp heat directly at the solder joints, away from sensitive substrate areas and adjacent components. The ThermoPik's self-adjusting integral vacuum pick and unique design provide easy, one-handed operation.

DTP-80 Dual ThermoPik Handpiece - Provides safe, one-handed reflow and removal of a wide variety of PQFPs and FlatPacks in just seconds. Its high thermal capacity and targeted heat quickly removes large SMDs without damage to the board or adjacent components, even on heavy, multilayer assemblies. The unique, vertically oriented design and a wide variety of quick change tips easily reach into tight work areas for safe SMD removal. The Dual ThermoPik's self-adjusting integral vacuum pick and unique design provide easy, one-handed operation.

General Information

Product Application

These products are very versatile and may be used to satisfy a variety of application requirements. If you require assistance in the use of this product for your particular application, contact your local authorized PACE distributor or PACE directly as shown on page ii.

Parts Identification

1. **POWER SWITCH -** Turns system ON ("1") and OFF ("0"); controls input power to system.
2. **CH 1 VARIABLE TEMPERATURE CONTROL -** Allows the operator to adjust the tip temperature for handpiece/tip combination connected to channel 1.
3. **CH 2 VARIABLE TEMPERATURE CONTROL -** Allows the operator to adjust the tip temperature for handpiece/tip combination connected to channel 2.
4. **CH 1 POWER RECEPTACLE -** Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to the handpiece connected to channel 1.
5. **CH 2 POWER RECEPTACLE -** Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to the handpiece connected to channel 2.
6. **CH 1 LED -** Green LED provides visual indication of duty cycle control of channel 1. Indicator lights as power is applied to the connected handpiece.
7. **CH 2 LED -** Green LED provides visual indication of duty cycle control of channel 2. Indicator lights as power is applied to the connected handpiece.
8. **AUTO SNAP-VAC PORT -** Quick connect fitting which provides quick-rise vacuum for Sodr-X-Tractor or ThermoPik handpieces. Vacuum is present when handpiece finger switch or optional foot pedal is actuated. Vacuum continues a minimum of 1.2 seconds after switch (or foot pedal) actuation.
9. **CONTROLLABLE PRESSURE PORT -** Quick connect fitting with adjustable valve which provides variable air flow for the ThermoJet handpiece. Air pressure is present when handpiece finger switch or optional foot pedal is actuated. Air pressure ceases 1.2 seconds after switch (or foot pedal) is released.
10. **EARTH GROUND RECEPTACLE -** Provides positive earth ground to which a ground cable can be connected from the workpiece or work surface as part of a static control program.

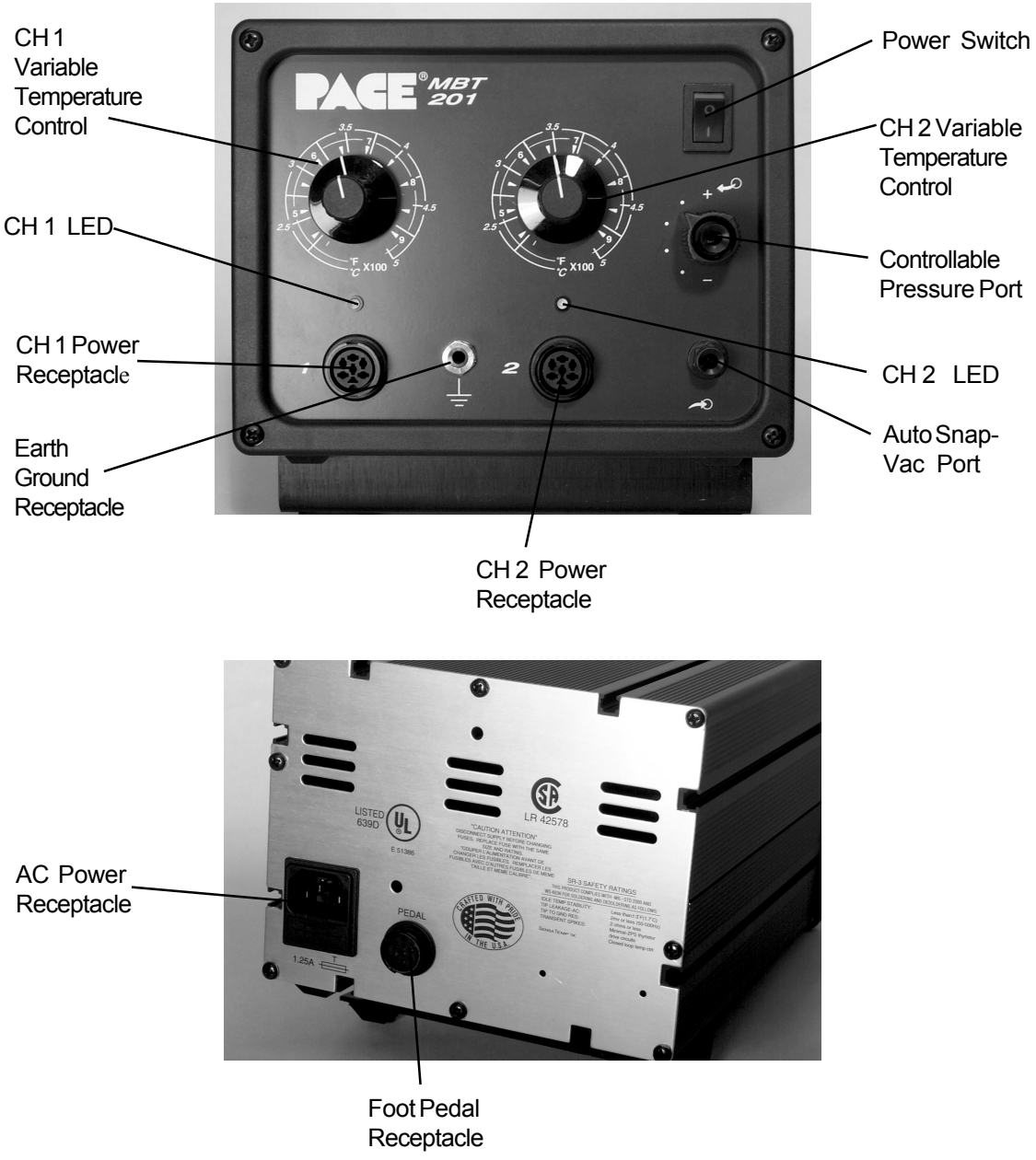


Figure 1. Parts Identification

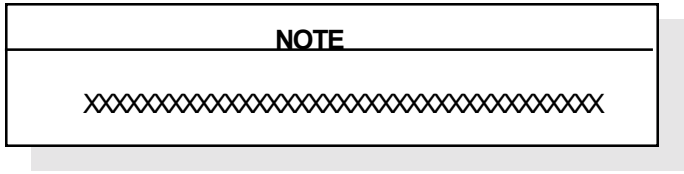
11. **POWER CORD -** Provides main power to system from AC outlet to AC Power Receptacle.
12. **AC POWER RECEPTACLE/FUSE HOLDER -** Receptacle for providing power to the system from AC outlet through Power Cord, and location of fuse which protects system from overcurrent conditions.
13. **FUSE -** Provides overload protection for MBT system.
14. **FOOT PEDAL RECEPTACLE -** Input for foot pedal (optional) which actuates vacuum or pressure to the air-operated handpieces.

Safety

The purpose of this "SAFETY" section is to inform users of the heading guidelines used in this manual to indicate special Notes, Cautions, Warnings or Dangers. Also included are recommended precautions which must be observed when operating or servicing this product.

Heading Guidelines

PACE adheres to the following Heading Guidelines (based on OSHA guidelines) when listing special information or precautions to be taken. Especially important are all procedures and practices which, if not strictly observed, could result in injury or loss of life.
These "NOTES", "CAUTIONS","WARNINGS" and "DANGERS" are inserted in this manual whenever deemed necessary. They appear in a blocked off form with double outline and a shaded background to highlight the information as shown below.



NOTE

Used to indicate a statement of company recommendation or policy. The message may relate directly or indirectly to the safety of personnel or protection of property. NOTE is not associated directly with a hazard or hazardous situation and is not used in place of "CAUTION", "WARNING" or "DANGER".

CAUTION

Used to indicate a hazardous situation which may result in minor or moderate injury. May also be used to alert personnel to conditions, procedures and practices which, if not observed, could result in damage to or destruction of the product or other equipment.

WARNING

Used to define additional information that if not closely followed might result in serious damage to equipment and represent a potential for serious personnel injury.

DANGER

Defines additional information that if not closely followed might result in severe personnel injury or death. Danger is not used for property damage unless personal injury risk is present.

Safety Guidelines, English Language

The following are safety precautions which personnel must understand and follow when using or servicing this product.

1. **POTENTIAL SHOCK HAZARD -** Repair procedures on PACE products should be performed by Qualified Service Personnel only. Line voltage parts may be exposed when the equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the product.

2. To prevent personnel injury, adhere to safety guidelines in accordance with OSHA and other applicable safety standards.

3. SensaTemp handpiece heaters and installed tips are hot when the handpiece is powered on and for a period of time after power off. **DO NOT** touch either the heater or the tip. Severe burns may result.

4. PACE Tip & Tool Stands and handpiece cubbies are designed specifically for use with the associated handpiece and houses it in a manner which protects the user from accidental burns. Always store the handpiece in its holder. Be sure to place the handpiece in its holder after use and allow to cool before storing.

5. Always use PACE systems in a well ventilated area. A fume extraction system such as those available from PACE are highly recommended to help protect personnel from solder flux fumes.

6. Exercise proper precautions when using chemicals (e.g., solder paste). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.

Sicherheit Korrekturlinien, Deutsche Sprache

Die nachfolgenden Sicherheitsvorschriften sollten vom Bedien- un Servicepersonal verstanden und befolgt werden.

1. **Entladung spannungsfuehrender Teile -** Reparaturen an PACE Produkten sollten nur von qualifizierten Personal durchgefuehrt werden. Spannungsfuehrende Teile koennen sich bei gezogenen Netzstecker entladen. Servicepersonal muss den Kontakt dieser Teile vermeiden.

2. Um moegliche Gefahren fuer Personen auszuschliessen, muessen alle Sicherheitsvorschriften in Uebereinstimmung mit OSHA und anderen anwendbaren Sicherheitsstandards eingehalten werden.

3. Angeschlossene SensaTemp Heizelemente von Handwerkzeugen und installierte Loetspitzen sind heiss wenn das System eingeschaltet ist oder erst vor kurzer Zeit ausgeschaltet wurde. Heizelement und Loetspitze nicht beruehren. Verbrennungsgefahr.

4. PACE Tip & Tool und andere Handwerkzeugablagen sind so konstruiert, dass ein versehentliches Beruehren des dazugehoerendes Handwerkzeuges vermieden wird. Bewahren Sie das Handwerkzeug nach Gebrauch stets in der Ablage auf. Bevor das Handwerkzeug an einem anderen Ort gelagert werden muss, lassen Sie es in der Werkzeugablage vollstaendig abkuehlen.

5. Benutze PACE Systeme nur in gut beluefteten Raeumen. Ein Loetrauchabsaugsystem, wie es z.B. von PACE erhaeltlich ist, hilft Bedienpersonen von den Gefahren von Loetrauch zu schuetzen.

6. Wenn Chemikalien (z.B.: Lotpaste) verwendet werden, muessen alle die in den Sicherheitsdatenblaettern des Herstellers ausgewiesenen Sicherheitsvorschriften eingehalten werden.

Directives de Sécurité, Française Langue

Les précautions suivantes, sont celles que le personnel doit comprendre et suivre lorsqu'il utilise, effectue la maintenance ou se sert d'un produit PACE.

1. **Danger potentiel de choc èlectrique -** Les procédures de réparation sur les produits PACE doivent être effectuées seulement par du personnel qualifié. Des parties de l'équipement désassemblées peuvent être sous tension. Le personnel de maintenance doit éviter tout contact avec ces parties en réparant le produit.

2. Pour prévenir tout préjudice, le personnel adhère au guide de sécurité en accord avec OSHA (équivalent à des normes françaises de sécurité) et d'autres standards de sécurité applicable.

3. La mise sous tension des outils SensaTemp comporte des éléments chauffants (buse). Ces derniers, gardent la chaleur même après la mise hors tension pendant un certain temps. **Ne pas** toucher les parties chaudes aux extrémités des outils. Des brûlures sévères peuvent en résulter.

4. Les outils PACE et leurs pannes ainsi que le support sont dessinés de manière spécifique afin de protéger l'utilisateur/opérateur de brûlures accidentelles. Reposer toujours les outils après chaque utilisation dans leurs étuis/supports afin de permettre leur refroidissement.

5. Utiliser toujours les stations Pace dans unlieu bien ventilé. Des extracteurs de fumée Pace sont hautement recommandés pour protéger votre personnel des vapeurs de soudure/flux.

6. Prenez les mesures nécessaires quand vous utilisez des produits (ex: solder paste) chimiques. Reportez-vous au document (fiche technique/sécurité) du fabricant fourni avec chaque produit. Respectez toutes les procédures de sécurité recommandées par le constructeur.

Misure di Sicurezza, Italiana Lingua

Le seguenti instruzioni sono misure di sicurezza che il personale deve comprendere e seguire quando utilizza o ripara I prodotti PACE.

1. **EVENTUALI RISCHI DI SHOCK ELETTRICO**- Si consiglia di far eseguire le operazioni di riparazione dei prodotti PACE, da un servizio di personale qualificato. Quando la stazione non é assemblata le parti sottoposte alla tensione di linea potrebbero essere scoperte. Il personale deve evitare il contatto con queste parti durante manutenzione del prodotto.

2. Per evitare eventuali pericoli al personale, attenersi alle norme di sicurezza previste dalla guida, in conformitá all'OSHA e agli altri Standard di Sicurezza applicabili.

3. Le resistenze PACE Sensatemp e le punte installate sono calde quando la stazione é accesa e per un periodo successivo allo spegnimento. Non toccare la resistenza e la punta. Puó comportare gravi ustioni.

4. I supporti PACE sono specificamente costruiti insieme alla corrispondente impugnatura e progettati per un uso che protegge gli utenti da ustioni accidentali. Mettere sempre l'impugnatura nel propio supporto dopo l'utilizzo e lasciarla raffredare prima di riporla.

5. Utilizzare sempre I stazioni PACE in una zona be aerata per proteggere il personale dai fumi. É fortemente raccomandato un sistema di aspirazione (dei fumi) come quello disposta dalla PACE.

6. Usare precauzioni quando si utilizzano sotanze chimiche (es. Pasta di stagno). Fare riferimento al Material Safety Data Sheet (MSDS) fornita con ogni sostanza chimica e seguire tutte le misure di sicurezza raccomandate dal fabbricante.

Guidelines de Segurança, Portuguese Lingua

Segeum-se precauções de segurança que os operadores devem compreender e seguir ao utilizar ou reparar produtos PACE.

1. **Perigo de choque eléctrico -** Os procedimentos de reparação em produtos PACE, devem ser apenas efectuados por pessoal qualificado. Linhas de alimentação podem ficar expostas ao desmontar o equipamento. Pessoal de reparação deve evitar o contacto com essas partes ao reparar o produto.

2. Para evitar danos pessoais, siga as normas de segurança OSHA ou outras normas aplicáveis.

3. Resistencias de aquecimento dos ferros e as pontas instaladas estão quentesquando o ferro está alimentado, e mesmo durante algum tempo após ser desligado. **NUNCA TOCAR** nem na resistencia de aquecimento nem na ponta. Pode resultar em queimaduras severas.

4. Os suportes para pontas e ferros da PACE, foram concebidos para uso especifico, e para proteger o operador de queimaduras acidentais. Coloque sempre os ferros nos respectivos suportes. Tenha a certeza de colocar sempre o ferro no respectivo suporte após cada utilização e deixe-o arrefecer antes de o guardar.

5. Utilize sempre os sistemas da PACE em locais bem ventilados. Um Sistema de extracção de fumos, como os Sistemas disponiveis na PACE, são altamente recomendados para a protecção dos utilizadores contra os fumos produzidos pela solda e fluxo.

6. Tenha precauções apropriadas ao utilizar produtos quimicos (ex. pasta de soldar). Lêr sempre atentamente os normas de segurança fornecidas com cada produto químico e siga sempre todas as precauções de segurança recomendadas pelo fabricante.

Guias de Consulta de Seguridad, Espãnol Lenguaje

Lo siguiente es precauciones de seguridad que el personal debe entender y debe seguir al usar o reparar productos de PACE.

1. **RIESGO de SHOCK POTENCIAL -** Los procedimientos de la Reparación en productos de PACE sólo deben ser realizados por Personal de Servicio Calificado. Pueden exponerse partes de voltaje de línea cuando el equipo se desmonta. El personal de servicio debe evitar contacto con estas partes al arreglar el producto.

2. Para prevenir lesión del personal, adhiera a las reglas de seguridad de acuerdo con OSHA y otras normas de seguridad aplicables.

3. Las herramientas SensaTemp tienen sus calentadores y las puntas instaladas calientes cuando la herramienta esta encendida y por un periodo de tiempo después de apagar el equipo. **No toque el calentador o la punta**. Las quemaduras severas pueden resultar.

4. El Soporte de punta y Herramienta PACE se diseñan específicamente para el uso con las herramientas asociadas y las almacena de una manera que protege al usuario de las quemaduras accidentales. Siempre guarde la herramienta en su soporte. Esté seguro de poner la herramienta en su soporte después del uso y permita que la herramienta enfríe antes de guardar.

5. Siempre use sistemas de PACE en una área bien ventilada. Un sistema de extraccíon de humo como esos disponibles de PACE se recomiendan para ayudar a protejer al personal contra los humos de flujo de soldadura.

6. Ejercicie las precauciones apropiadas al usar químicos (ej., pasta de la soldadura). Refiérase a la Hoja de Datos de Seguridad de Material (MSDS) proporcionadó con cada químico y adhiere a todas las precauciones de seguridad recomendadas por el fabricante.

Säkerhetsföreskrifter, Svenska

Följande säkerhetsföreskrifter måste förstås och följas av personal som använder eller utför service på PACE produkter.

1. **RISK FÖR STRÖMSTÖT** - Service / Reparation av PACE produkter får endast utföras av aktoriserad service personal. Strömförande delar kan kommas åt när produkten är isärplockad. Iaktag aksamhet när felsökning görs för att undvika strömstötar.

2. För att undvika personskada rekommenderas att OSHA eller andra liknande arbetssäkerhets standarder följs.

3. SensaTemp verktygselement och installerade spetsar är heta när strömmen är påslagen och en tid efter att strömmen slagits av. **RÖR EJ** element eller spets. Risk för brännskador!

4. PACE Spets och Verktygshållare är speciellt utformade för att passa PACE respektive verktyg så att risken för brännskador kan undvikas. När verktyget ej används bör det alltid förvaras i sin hållare.

5. Tillse att ventilationen är god där PACE System används. Ett lödröksutsug system som t.ex. PACE tillhandahåller rekommenderas för att skydda användaren för giftig lödrök.

6. Tillse att gällande säkerhetsföreskrifter följs vid användning av kemikalier, t.ex. lodpasta.Se säkerhetsdatabladen som medföljer kemikalierna och följ de rekommenderade säkerhetsföreskrifterna från respektive tillverkare. Säkerhetsföreskrifter, Svenska

System

Using Figures 2, 3 and 4 as a guide, set up the MBT 201 system using the following steps.

1. Store the shipping container(s) in a convenient location. Re-use of these containers will prevent damage if you store or ship the system.

2. Place Power Switch in the “Off” or “0” position.

3. Position the system on a convenient bench.

4. Plug the Power Cord into AC Power Receptacle/Fuse Holder at the rear panel of the system.

IMPORTANT
The AC supply receptacle must be checked to ensure proper grounding before initial system operation.

5. Assemble the Tip & Tool Stand(s) and, if desired, attach to the power source. Assembly instructions are enclosed with each stand.

6. If you have purchased the optional Tip & Temperature Selection System Chart Holder (1257-0186-P1), attach it to the top of the power source using the supplied instructions.

7. Install the Tip & Temperature Selection System Charts booklet onto Chart Holder (if present). This booklet is supplied with each system.

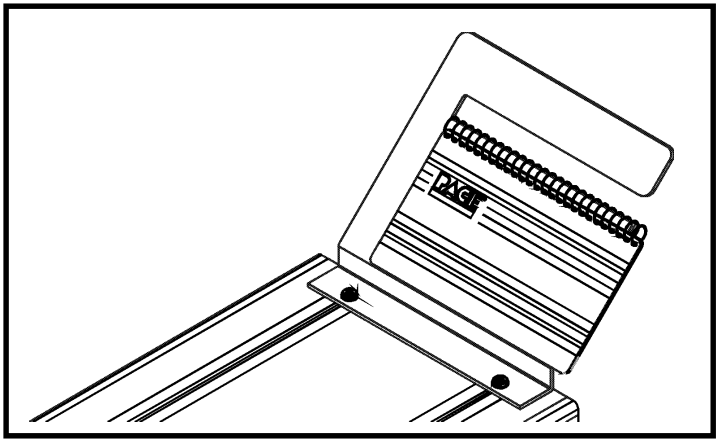


Figure 2. Tip & Temperature Chart Holder (Optional)

8. Place handpiece(s) into the Tip & Tool Stand(s).

9. Using Figure 3 as a guide, connect the handpiece(s) to the Power Source in the following manner:

   a) With the Connector Key end facing the power source, turn the Locking Ring fully counterclockwise.

   b) Align the Connector Key with the Receptacle Keyway.

   c) Insert the connector into the Power Receptacle.

   d) Turn the Locking Ring fully clockwise to lock in place.

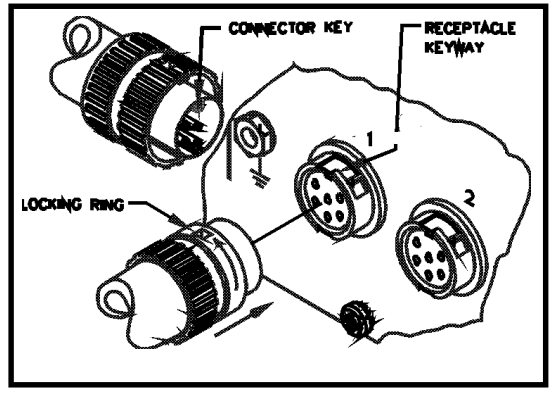


Figure 3. Handpiece Connection

10. To avoid confusion among handpieces on MBT 201 systems, PACE recommends the use of colored markers (P/N 6993-0136 Cable Marker Kit) to identify the particular handpiece power cable and/or air hose. Attach any two like colored markers, one to each end of the handpiece power cable or air hose. Select and use a different color marker for each handpiece.

11. If you have purchased the optional foot pedal, insert the foot pedal connector plug into the Foot Pedal Receptacle on the rear panel of the power source. (See figure 4)

12. Plug the prong end of the Power Cord into a convenient three wire grounded outlet.

13. Place the Power Switch in the “On” or “1” position. The system is now ready for operation.

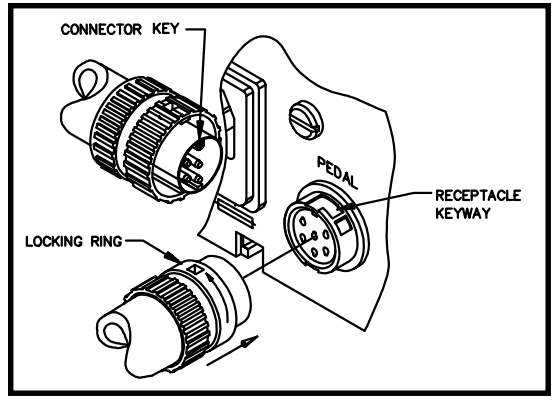


Figure 4. Foot Pedal Connection

Handpiece Vacuum/Pressure

AIR HOSE CONNECTION

There are two methods of attaching the Air Hose from the PACE power source to the air handpiece. Select the method which best suits your needs. The Quick Connect Method is best suited for configurations where multiple air handpieces may be in use. The Traditional Method is best suited for single air handpiece configurations.

CAUTION
Regardless of connection method, ensure that only one Air Hose is connected to the VisiFilter assembly (connected to the **AUTO SNAP-VAC** Port) or Controllable **PRESSURE** Port at one time. Attachment to both ports simultaneously will cause a deterioration of performance.

QUICK CONNECT METHOD

To set up each air handpiece for the quick connect operation, perform the following steps.

1. Attach a 1 inch length (2.5cm) of clear pvc Air Hose (P/N 1325-0003-07) to the metal tube in the back of each handpiece.

2. To the other end of the 1 inch (2.5cm) clear pvc Air Hose attach a Female Quick Connect Hose Mount Fitting (P/N 1259-0086). Secure this short Air Hose to the handpiece power cable with one Cable Clip (P/N 1321-0085-01).

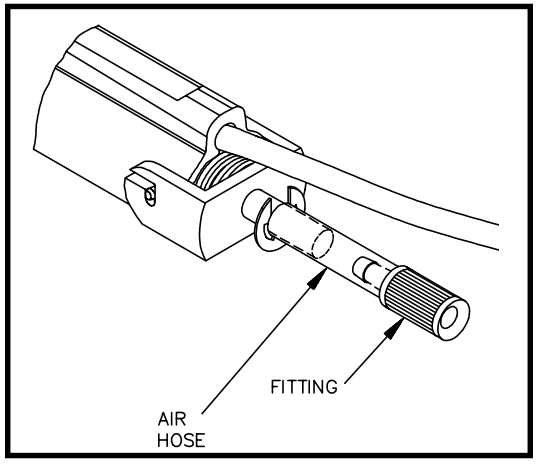


Figure 5. Handpiece Quick Connect Hose

3. Prepare a quick connect Air Hose by inserting a Metal Hose Clamp (P/N 1211-0036) & a Male Quick Connect Hose Mount Fitting (P/N 1259-0087) into each end of a 54 inch (137cm) length of Air Hose. Push the ridged ends of the fittings into the hose; slide & twist the metal hose clamps over the connections to secure. You may already have this piece if you have other quick disconnect handpieces configured.

4. Prepare a VisiFilter in the following manner.

   a) Connect a 1 inch (2.5cm) length of clear pvc Air Hose to each side of the VisiFilter; push and turn hose onto VisiFilter nipple to seat.

   b) To the free end of the Air Hose connected to the FLOW IN side of the VisiFilter, insert the ridged end of a Female Quick Connect Hose Mount Fitting (P/N 1259-0086).

   c) Insert the ridged end of a Male Quick Connect Hose Mount Fitting (P/N 1259-0087) in the free end of the Air Hose connected to the FLOW OUT side of the VisiFilter.

   d) Connect the VisiFilter Air Hose (with attached Male Quick Connect Hose Mount Fitting) to the power source **AUTO SNAP-VAC** Port**.**

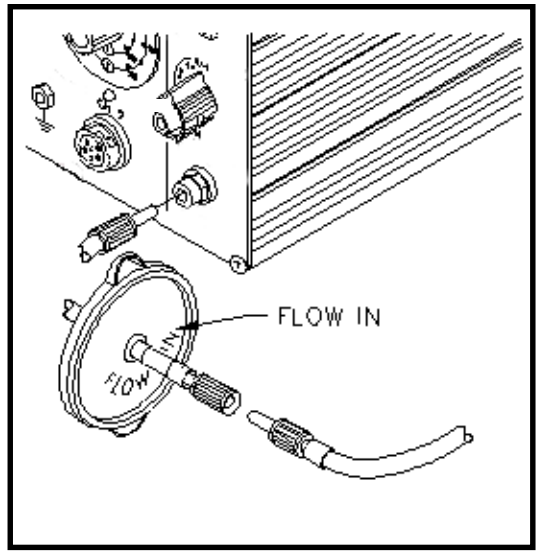


Figure 6. VisiFilter Set-Up

5. For vacuum, insert the Male Quick Connect Hose Mount Fitting connected to the long Air Hose into the Female Fitting on the 1 inch (2.5cm) Air Hose (connected to VisiFilter). For pressure, insert the Male Quick Connect Hose Mount Fitting directly into the Controllable **PRESSURE** Port.

CAUTION

When removing any Air Hose, turn and pull. DO NOT attempt to pull Air Hose directly off. Damage to or breakage of Vacuum Fitting or VisiFilter may occur.

TRADITIONAL METHOD

1. Connect the 54 inch (137cm) length of Air Hose to the metal tube in the back of each air handpiece.

2. Insert a Male Quick Connect Hose Mount Fitting (P/N 1259-0087) to the free end of the 54 inch (137cm) length of Air Hose. Secure the Air Hose to the handpiece power cable with Cable Clips (P/N 1321-0085-01).

3. Prepare a VisiFilter in the following manner.

   a) Connect a 1 inch (2.5cm) length of clear pvc Air Hose to each side of the VisiFilter; push and turn hose onto VisiFilter nipple to seat.

   b) To the free end of the Air Hose connected to the FLOW IN side of the VisiFilter, insert the ridged end of a Female Quick Connect Hose Mount Fitting (P/N 1259-0086).

   c) Insert the ridged end of a Male Quick Connect Hose Mount Fitting (P/N 1259-0087) in the free end of the Air Hose connected to the FLOW OUT side of the VisiFilter.

   d) Connect the VisiFilter Air Hose (with attached male quick connect hose mount Fitting) to the power source **AUTO SNAP-VAC** Port**.**

4. For vacuum, insert the Male Quick Connect Hose Mount Fitting connected to the long Air Hose into the Female Fitting on the 1 inch (2.5cm) Air Hose (connected to VisiFilter). For pressure, insert the Male Quick Connect Hose Mount Fitting directly into the Controllable **PRESSURE** Port.

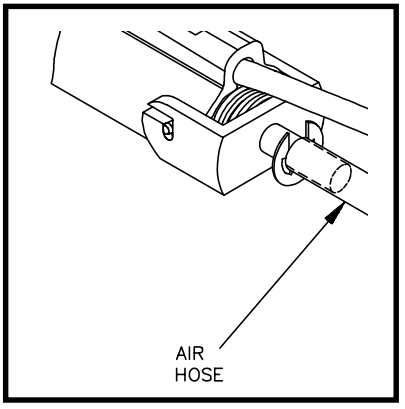


Figure 7. Air Hose Connection

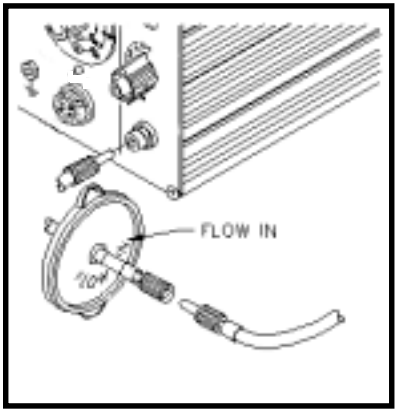


Figure 8. VisiFilter Set-Up

CAUTION
When removing any Air Hose, turn and pull. DO NOT attempt to pull Air Hose directly off. Damage to or breakage of Vacuum Fitting or VisiFilter may occur.

Quick Start Procedure

The MBT 201 systems are very easy to operate. As received from the factory, the system can be quickly set up for use in standard soldering/desoldering operations. Simply perform the following Quick Start Procedure to begin system operation.

1. Ensure that the Set-Up procedure has been performed; check for the following:
   a) VisiFilter connection to the **AUTO SNAP-VAC** Port on the front panel of the power source.
   b) Handpiece cable and air hose connections to the power source.

NOTE
If more than one air-operated handpiece (SX-80, TJ-70 or TP-65) is connected to the power source, ensure that only one of the Air Hoses is connected to either the VisiFilter assembly (connected to the **AUTO SNAP-VAC** Port) or the Controllable **PRESSURE** Port. Attachment to both simultaneously will cause a deterioration in performance.

   a) All handpiece Tip & Tool Stands set up as desired (using instructions enclosed).
   b) Proper tips installed in handpieces.
   c) Power cord connection between the house AC supply receptacle and the power source.
2. Turn the Power Switch to the "On" ("I") position.
3. Adjust the Variable Temperature Control of each channel with a connected handpiece to the desired tip temperature.
4. Observe the Channel LEDs. Once stabilized at the set Tip Temperature, the associated LED will flash at a constant rate.

NOTE
Read the "Operation" section of this manual to utilize the full capabilities of the system. This is especially important when using large soldering tips. Refer to the enclosed handpiece manuals for a complete description of handpiece capabilities.

Tip & Temperature Selection

TIP OFFSET

Differences between temperature settings and true tip temperatures are negligible when using Thru-hole, single point soldering or desoldering tips. With any heating system however, actual tip temperatures can differ greatly from temperature control settings when using larger SMT soldering tips. This difference is called Tip Temperature Offset. The PACE “Tip & Temperature Selection System” allows you to select and maintain a True Tip Temperature for any size and type of tip using the appropriate Tip Offset compensation value.

PACE recommends the use of the Tip & Temperature Selection System Booklet (PACE P/N 5050-0251) included with your system) as a guide to accurately set and maintain a True Tip Temperature. Select the appropriate handpiece chart (in the booklet) for your application; identify the correct tip and Dial/Display setting for the desired tip temperature. Then set the Variable Temperature Control (Dial/Display setting) for the channel powering the handpiece to obtain the desired True Tip Temperature.

VARIABLE TEMPERATURE CONTROL

Adjust the Variable Temperature Control(s) to the desired temperature setting. Notice that the control dial has a Gray scale denoting temperature in °C (Celsius) and a Yellow scale denoting temperature in °F (Fahrenheit). These numerical scales denote the set tip temperature x 100 (e.g., "3" on the Yellow scale is 3 x 100 or 300°C).

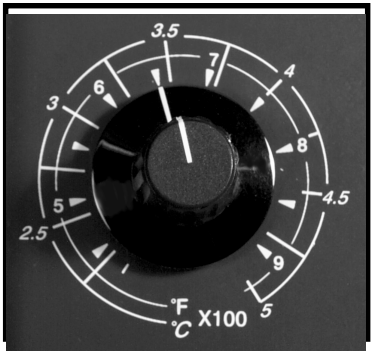


Figure 10. Adjust Temperature

Channel LED Operation

The Channel LED(s) are a visual indication of Power Output status. Following is an explanation of these status indicators.

LED Full On - Continuous power is being delivered to the handpiece connected to the associated channel. This condition is evident when the system is first powered up (handpiece heater cold) or the Variable Temperature Control is increased.

LED Flashing - Indicates that the set tip temperature (as set on the associated Variable Temperature Control) has been reached. Power to the handpiece is cycling off and on to maintain set temperature.

LED Off - No power is being delivered to the handpiece connected to the associated channel. This condition is evident if the Variable Temperature Control is decreased.

VisiFilter Element Replacement

Follow the procedure listed below to replace the VisiFilter Element when it becomes clogged or discolored.

1. Disconnect the handpiece air hose by gently turning and pulling the Coupled Fittings.
2. Disconnect the Visifilter and hose assembly from the Power Source by gently turning and pulling the Male Fitting inserted into the **AUTO SNAP-VAC** Port.
3. Disconnect VisiFilter from both attached 1 inch air hoses by gently turning and pulling the VisiFilter while holding each of the hoses.
4. Separate the 2 plastic housing halves of the VisiFilter in the following manner.
   a) Grasp the VisiFilter in the palm of the hand with the Male Nib (air hose connection) marked "FLOW IN" facing you.
   b) Pull against one of the Wing Tabs while pulling on the Male Nib with the free hand to open the interconnection of the plastic housings at that Wing Tab.
   c) Pull against the second Wing Tab while pulling on the Male Nib to open the remaining interconnection and separate the plastic housings.
5. Remove the old or discolored Element and discard.
6. Insert the replacement VisiFilter Element into the housing marked "FLOW IN". Center the Element in the housing well.
7. Squeeze the 2 plastic housing halves together using 4 plastic Bumps on the housing marked "FLOW OUT" as pressure points. The 2 plastic housings will snap together and lock the VisiFilter Element in position.

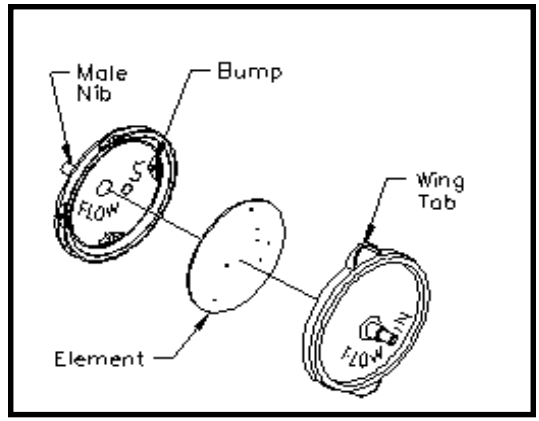


Figure 11. VisiFilter Element Replacement

8. Reconnect the 1 inch air hoses (removed in step 3) to the VisiFilter.
9. Attach VisiFilter and hose assembly to Power Source by inserting Male Fitting into the **AUTO SNAP-VAC** Port.

Handpieces

The following "Heater Assembly Checkout Procedures" are applicable to all PACE handpieces except for the TT-65 ThermoTweez handpiece. Refer to either of the TT-65 manuals (P/N 5050-0300 or 5050-0336) for troubleshooting procedures pertinent to that handpiece.

Perform the "Heater Assembly Checkout Procedures" with the handpiece (and heater) at room temperature. If the handpiece is warm, resistance readings will be different from those shown.

Symptom	Checkout Procedure	Cause	Solution	Heater Specs.
No Heat	Check resistance Pin 2 to Pin 5. Refer to Heater Specs. column at right. If resistance is high -	Open heater	Replace Heater assembly.	SX-80 = 8.6 – 9.1 Ω PS-90 = 8.7 – 9.4 Ω TP-65 = 9.2 – 10.2 Ω TJ-70 = 5.8 – 6.3 Ω PS-70 = 11.3 – 12.3 Ω TT-65 = 10.7 – 11.9 Ω
	Check resistance Pin 3 to Pin 6. If circuit reads open -	Open sensor	Replace Heater Assembly	
Handpiece is overheating	Check resistance Pin 3 to Pin 6. Resistance should be 110 Ohms. If circuit resistance reads less than 105 Ohms -	Shorted sensor.	Replace Heater Assembly.	
Fuse blows when unit is turned on.	Check resistance Pin 2 to Pin 5. Refer to Heater Specs. column at right. If resistance is low –	Solder short in handpiece	Remove short. Replace Heater Assembly and Fuse F1	
		Shorted Heater	Replace Heater Assembly and Fuse F1.	
No ground on tip.	Check resistance Pin 4 to a new tip. Resistance should be less than 2 Ohms. If not -	Oxidation buildup in Heater Bore	Clean Heater Bore with wire brush.	
		Defective Heater	Replace Heater Assembly.	

Table I. Heater Assembly Checkout Procedures

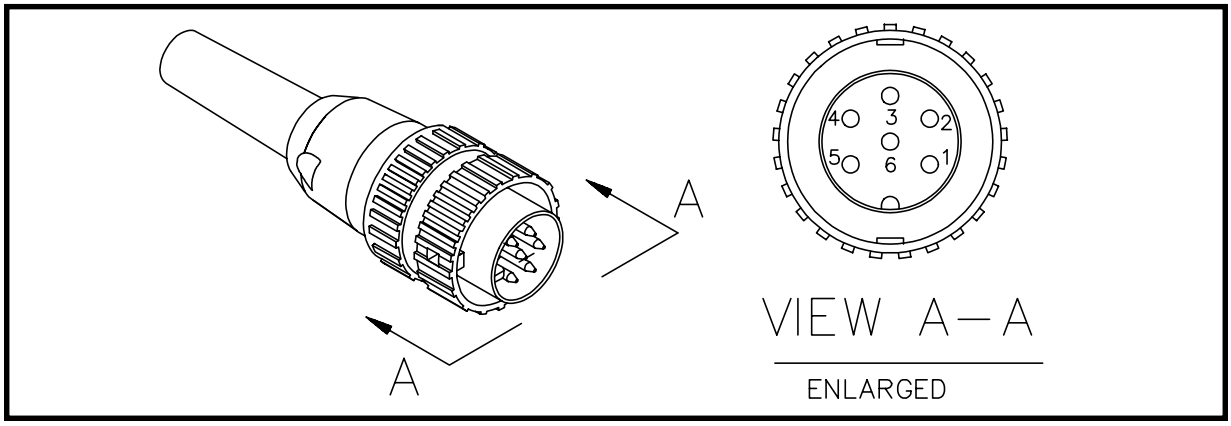


Figure 12. Connector Plug Wiring

Power Source

Most malfunctions are simple and easy to correct. Refer to the table shown below to clear these malfunctions.

SYMPTOM	PROBABLE CAUSE	SOLUTION
No power to system.	Blown Fuse (F1).	Replace fuse F1 located on rear of Power Source in the AC Receptacle/Fuse Holder.
No heat on handpiece. Other handpieces work on Power Source channel.	Defective Heater.	See Table I or refer to handpiece Manual.
No heat on handpiece. Other handpieces do not work on Power Source channel.	Defective control circuit.	Contact PACE Technical Support

Table II. Power Source Corrective Maintenance

Power Source

Listed below are the replacement parts which may be ordered through your local authorized PACE distributor.
To inquire about parts other than those listed below, contact PACE as shown on page ii.

Item No.	Description	PACE Part Number	
		MBT 201	MBT 201E
1	Power Switch	1157-0052	1157-0052
2	AC Power Receptacle/Fuse Holder	1207-0151	1207-0151
3	Fuse (F1), 1.25A (MBT 201)	1159-0217	N/A
	0.63A (MBT 201E)	N/A	1159-0214
4	Service Manual	5050-0340	5050-0340

Table III. Power Source Replacement Parts

Accessory Kit

Listed below are items included in MBT 201 System Accessory Kit (P/N 7950-0112).

Item #	Description	PACE Part Number MBT 201/MBT 201E
1	Tool, Tip	1100-0206
2	PS-90, 1/32" Conical	1122-0002
3	PS-90, 1/8" Chsl.	1122-0003
4	Tip, Endura, .040ID, Thdr.	1121-0624-KB
5	Wire brush, 3/16" Dia., 6" Long	1127-0014
6	Disconnect, Quick Female, Hose	1259-0086
7	Disconnect, Quick Male, Hose	1259-0087
8	VisiFilter	1309-0028
9	Holder, Tube, Gray, (Qty. 6)	1321-0085-01-P6
10	Clear PVC tubing, 1" (Qty. 2)	1325-0003-07
11	Silicone tubing, Black, 54"	1342-0015-08
12	Label, 1.75" Square	1351-0774
13	Tip cleaning kit	6993-0200
14	Kit, Angle Bracket	6018-0097
15	Instruction Sheet, Tip and Tool Stand	5050-0357
16	Screwdriver, PACE	1100-0230
17	Promo., Flux/Sodr Trap Kit	6993-0217
18	Cleaning Tool Assembly, Fiber	1100-0232
19	Cleaning Tool Assembly, Sponge	1100-0233
20	Cleaning Station, SMT	6021-0006-P1
21	SX-80 F/S Trap Cubby Kit	6993-0230

Table IV. Accessory Kit

LIMITED WARRANTY

PACE warrants that this equipment will be free of defects in materials and workmanship for a period of one (1) year from the date of receipt by the first user.

This warranty does not cover repair or replacement required as a result of misuse, mishandling or improper storage. Failure to perform recommended routine maintenance, alterations or repairs made other than in accordance with PACE's directions, or removal or alteration of identification plates in any way will void this warranty. This warranty is available only to the first user, but the exclusions and limitations therein apply to all persons and entities.

This warranty does not apply to consumable items, such as tips, filter elements, hoses, collection chambers etc., except that heaters are normally warranted for a period of six (6) months from the date of receipt by the first user.

PACE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

PACE will, at its option, repair or replace any defective equipment or parts at its facility or other location approved by it at no charge to the user, or provide parts without charge for installation by the user in the field at user's expense and risk. User will be responsible for all costs of shipping equipment to PACE or other warranty location for warranty service.

EXCEPT FOR THE REMEDY ABOVE DESCRIBED, UNLESS OTHERWISE REQUIRED BY APPLICABLE LAW, PACE WILL HAVE NO OTHER OBLIGATION WITH REGARD TO ANY BREACH OF WARRANTY OR OTHER CLAIM WITH RESPECT TO THE EQUIPMENT, OR LIABILITY FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL LOSS OR DAMAGE CAUSED BY OR OCCURRING IN CONNECTION WITH ANY OF THE EQUIPMENT.

To obtain warranty service, contact the appropriate PACE company listed below

PACE Inc. 9893 Brewers Court, Laurel, Maryland 20723-1990
Tel. (888) 535-7223 (toll-free) Warranty Service FAX 301 483 7030

PACE Europe Ltd. Sherbourne House Sherbourne Drive Tilbrook Milton Keynes United Kingdom MK7 8HX
Tel. (44) 01908 277 666 Warranty Service FAX (44) 01908 277 777

Do NOT return defective equipment or parts to PACE without obtaining prior authorization.

Any warranty or other claim with respect to the equipment must be made in writing and delivered to PACE (or local authorized PACE Distributor outside the U.S.) within a reasonable time of the expiration date of this warranty. Sufficient evidence of purchase and date of receipt must also be included, otherwise user's rights under this warranty shall be deemed waived.